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David W. Hacker
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November 14, 2008

CERTIFIED MAIL NO. 7008 0500 0001 8815 6397
RETURN RECEIPT REQUESTED

United States Environmental Protection Agency
Air Enforcement and Compliance Assurance Branch
U.S. Environmental Protection Agency – Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

RE: Unite States Steel – Granite City Works (GCW)
Blast Furnace Casthouse Baghouse Performance Test Sampling Protocol/Notification and Request for an Extension
USEPA - Information Request Letter
I.D. No.: 119813AAI

To Whom It May Concern:

Enclosed is the sampling protocol for U.S. Steel Corporation, Granite City Works Blast Furnace Casthouse Baghouse Performance Test requested by the USEPA Region 5 in an Information Request letter, in Appendix C Item 17, received on October 27, 2008. The testing is tentatively scheduled to begin at 8:00 a.m. on December 10, 2008 for a period of 2 days.

Due to a market downturn, GCW is currently operating at extremely low production rates with only one Blast Furnace in operation. Item 17 in Appendix C of the Information Request letter states, "Tests must be conducted during operation of *both* blast furnaces and under the worst case emission scenario (i.e. *maximum production*, collection, etc.)", however, GCW only has one furnace in operation. Because "B" Furnace has been down since October 8, 2008 and is not anticipated to go back online until sometime in early 2009, GCW will not be able to perform the stack test per the testing requirement mentioned above. Therefore, GCW is requesting an extension of 90 days in hopes that the market demand will increase sufficiently in the 1st Quarter of 2009 for GCW to test as close to normal production as possible. The testing firm has been retained for the test date noted above so please let me know as soon as possible if we can postpone the test date to allow for emission testing to be performed in accordance to the request.

Your consideration of this matter is greatly appreciated. Should you have questions or require further information, please feel free to call me at 412-433-2919 or email DWHacker@uss.com. You can also contact Larry Siebenberger at 618-451-3391 or email LGSiebenberger@uss.com.

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to section 113(c)(2) of the Act, and 18 U.S.C.§ § 1001 and 1341.

Sincerely,

David Hacker (Y.)

David W. Hacker
U.S. Steel Corporate

Enclosure

cc: Julie Armitage, Acting Manager
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Bureau of Air
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P.O. Box 19276
Springfield, Illinois 62794-9276
CERTIFIED MAIL NO. 7008 0500 0001 8815 6380

TEST PROTOCOL

EMISSION TEST PROGRAM
CASTHOUSE BAGHOUSE
IRONSPOUT BAGHOUSE

UNITED STATES STEEL CORPORATION
GRANITE CITY, ILLINOIS

PREPARED FOR:

UNITED STATES STEEL CORPORATION
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Senior Project Manager
Source Testing Division

ARI Project No. 436-157 Revision 2
Proposal No. 34008
Date: November 12, 2008

TABLE OF CONTENTS

SECTIONONE Introduction

ARI Environmental, Inc. (ARI) has been retained by United States Steel Corporation (US Steel) to conduct an emission test program on the Casthouse Baghouse and Ironspout Baghouse stacks at their facility in Granite City, Illinois.

The purpose of the testing is to determine the concentrations and emission rates of particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO) and volatile organic material (VOM).

Testing procedures and sampling methodology will be conducted pursuant to the following procedures and/or regulations:

- Code of Federal Regulations, Title 40, Part 60 (40 CFR 60), Appendix A, Test Methods, USEPA Methods 1-5, 6C, 7E, 10 and 25A
- 40 CFR 51, Appendix M, USEPA Method 205
- Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods

Included in this protocol are sections detailing the proposed test program, QA/QC procedures, test schedule and ARI's general capabilities and experience.

SECTION TWO Testing and Analytical Procedures

2.1 OVERVIEW

ARI has been retained by US Steel to conduct an emissions test program at their facility in Granite City, Illinois.

Three (3) 96-minute test runs will be conducted at the Casthouse Baghouse and Ironspout Baghouse stacks. During each test run, the following gas parameters will be measured:

Temperature, °F
Velocity, fps
Volume flow rate - acfm, scfm, dscfh
Oxygen (O_2) - % by volume, dry basis
Carbon Dioxide (CO_2) - % by volume, dry basis
Particulate Matter (PM)
  Concentration – gr/dscf, lb/dscf
  Emission rate - lb/hr
Sulfur Dioxide (SO_2)
  Concentration - ppmv db, lb/dscf
  Emission rate - lb/hr
Nitrogen Oxides (NO_x)
  Concentration - ppmv db, lb/dscf
  Emission rate - lb/hr
Carbon Monoxide (CO)
  Concentration - ppmv db, lb/dscf
  Emission rate - lb/hr
Volatile Organic Material (VOM)
  Concentration - ppmv db, lb/dscf
  Emission rate - lb/hr

2.2 METHODOLOGY

Test procedures and sampling methodology will follow the Code of Federal Regulations, 40 CFR, Part 60, Appendix A, Test Methods, USEPA Methods 1-4, 5, 6C, 7E, 10 and 25A; 40 CFR, Part 51, Appendix M, USEPA Method 205; and the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods as outlined below:

USEPA METHOD	DESCRIPTION
1	Sample and Velocity Traverses for Stationary Sources
2	Determination of Stack Gas Velocity and Volumetric Flow Rate
3A	Determination of Oxygen and Carbon Dioxide Concentrations in Emission from Stationary Sources
4	Determination of Moisture Content in Stack Gases
5	Determination of Particulate Emissions from Stationary Sources

USEPA METHOD	DESCRIPTION
6C	Determination of Sulfur Dioxide Emissions from Stationary Sources (Instrumental Analyzer Procedure)
7E	Determination of Nitrogen Oxide Emissions from Stationary Sources (Instrumental Analyzer Procedure)
10	Determination of Carbon Monoxide Emissions from Stationary Sources
25A	Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer
205	Validation of Gas Dilution Systems for Field Instrument Calibrations

2.2.1 Sampling Location (USEPA Method 1)

The sampling location currently meets minimum USEPA Method 1 requirements for location upstream and downstream of flow disturbances or duct geometry changes. The velocity sampling points will be determined following USEPA Method 1. The sampling location and number of velocity sampling points will be as follows:

Test Location	Duct Diameter (inches)	No. Ports	No. Downstream Diameters from Flow Disturbance	No. Upstream Diameters from Flow Disturbance	Sampling Points per Port	Total Points
Casthouse Baghouse	132	2	2.8	0.7	12	24
Ironspout Baghouse	84	4	2.8	2.1	6	24

2.2.2 Stack Gas Velocity and Volumetric Flow Rate (USEPA Method 2)

Velocity traverses will be made with a Type-S pitot tube in accordance with USEPA Method 2. The velocity head will be determined using a Dwyer inclined oil manometer read to the nearest 0.01 in. H_2O. Temperature measurements will be determined using a Chromel-Alumel thermocouple connected to a digital direct read-out potentiometer.

2.2.3 Stack Gas Molecular Weight (USEPA Method 3A)

The stack gas molecular weight will be determined following USEPA Method 3A procedures. A complete description of this method is given in Subsection 2.2.6 detailing instrument analyzer methods.

2.2.4 Stack Gas Moisture Determination (USEPA Method 4)

Stack gas moisture determination will be conducted in accordance with USEPA Method 4 and combined with the USEPA Method 5 sampling train.

2.2.5 Particulate Matter Determination (USEPA Method 5)

Particulate matter will be determined following the procedures described in USEPA Method 5 - Determination of Particulate Emissions from Stationary Sources.

Sampling Apparatus

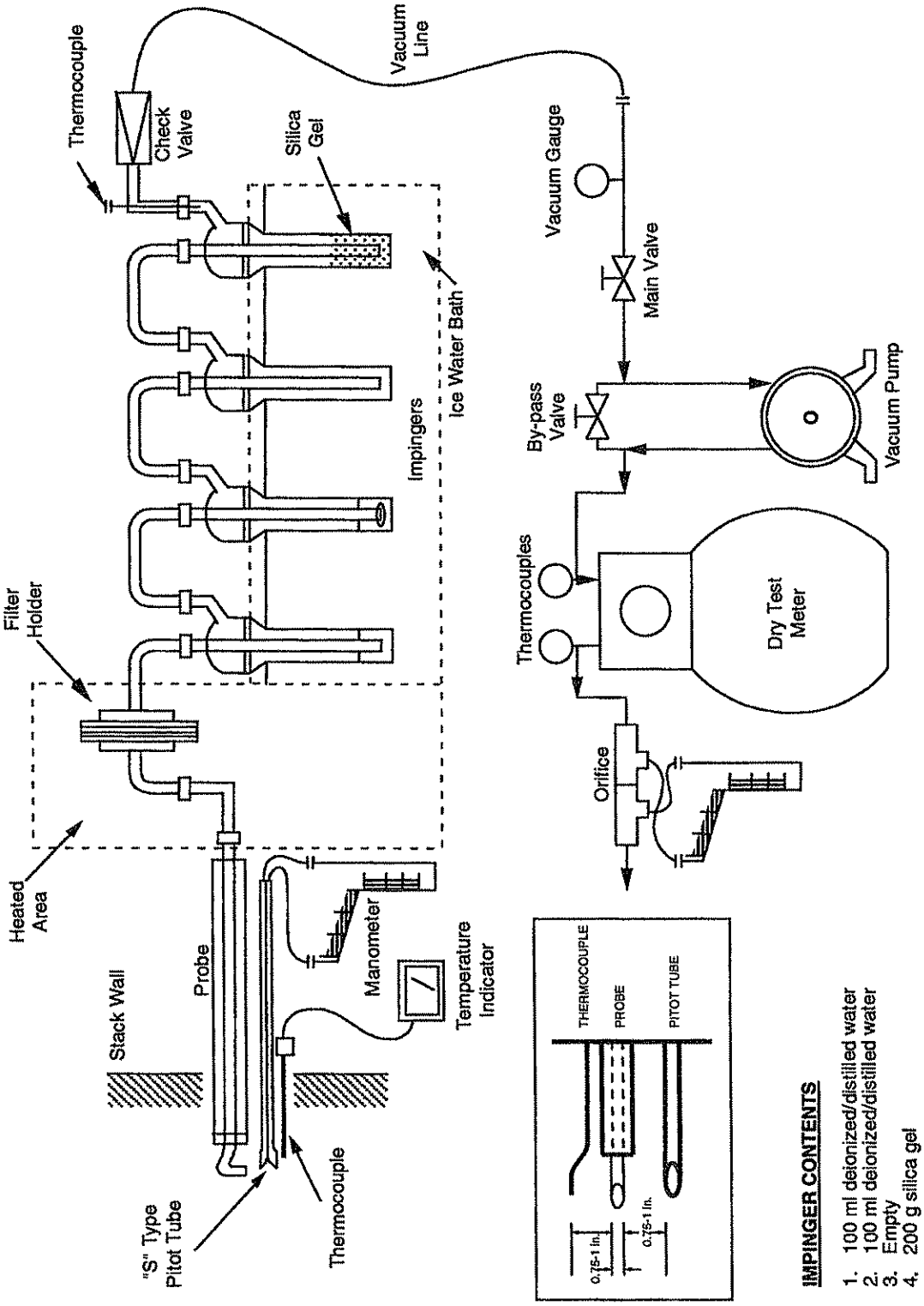
The particulate sampling train to be used during these tests meets design specifications established by the United States Environmental Protection Agency (USEPA). Assembled by ARI personnel, it consists of the following:

- Nozzle - Stainless steel (316) with sharp, tapered leading edge.
- Probe - Borosilicate glass with a heating system capable of maintaining a probe exit temperature of 248°F ±25°F.
- Pitot Tube - Type-S, or equivalent, attached to probe for monitoring stack gas velocity.
- Filter Holder - Borosilicate glass with a glass frit filter support and a silicone rubber gasket. The holder design provides a positive seal against leakage from the outside or around the filter. The filter holder is heated to 248°F ±25°F.
- Draft Gauge - Inclined manometer with a readability of 0.01 in. H_2O in the 0- to 10-in. range.
- Impingers – Four (4) impingers connected in series with glass ball joints. The first and third are of the Greenburg-Smith design with standard tips. The second and fourth are of the Greenburg-Smith design, but modified by replacing the standard tip with a ½-in.-i.d. glass tube extending to within ½ in. of the bottom of the impinger flask.
- Metering System - Apex Model 522. Vacuum gauge, leak-free pump, thermometers capable of measuring temperature to within 5°F, dry gas meter with ±2 percent accuracy, and related equipment as required to maintain an isokinetic sampling rate and to determine sample volume.
- Barometer - Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within ±0.1 in.Hg.

Sampling Procedure

Approximately 200 grams of silica gel is weighed and placed in a sealed impinger prior to each test. Glass-fiber filters are initially heated to 248°F ±25°F for 2 to 3 hours and desiccated for at least 2 hours and weighed to the nearest 0.1 mg on an analytical balance. One hundred milliliters (mL) of distilled water is placed in each of the first two impingers; the third impinger is initially empty; and the fourth impinger contains silica gel. The train is set up with the probe as shown in Figure 2-1.

SECTION TWO Testing and Analytical Procedures



IMPINGER CONTENTS

1. 100 ml deionized/distilled water
2. 100 ml deionized/distilled water
3. Empty
4. 200 g silica gel

FIGURE 2-1. USEPA METHOD 5 PARTICULATE MATTER SAMPLING TRAIN

SECTION TWO Testing and Analytical Procedures

The sampling train is leak-checked at the sampling site prior to each test run by plugging the inlet to the nozzle and pulling a 15-in.Hg vacuum; and at the conclusion of the test, by plugging the inlet to the nozzle and pulling a vacuum equal to the highest vacuum reached during the test run.

The pitot tube and lines are leak-checked at the test site prior to and at the conclusion of each test run. The check is made by blowing into the impact opening of the pitot tube until 3 or more inches of water is recorded on the manometer and then capping the impact opening and holding it for 15 seconds to assure it is leak-free. The static pressure side of the pitot tube is leak-checked by the same procedure, except suction is used to obtain the 3-in. H_2O manometer reading. Crushed ice is placed around the impingers to keep the temperature of the gases leaving the last impinger at 68°F or less.

During sampling, stack gas and sampling train data are recorded at each sampling point and whenever significant changes occur in stack flow conditions. Isokinetic sampling rates are set throughout the sampling period with the aid of a calculator.

Sample Recovery Procedure

After sampling is completed, the sampling train is then moved carefully from the test site to the cleanup area.

The sample fractions are recovered as follows:

Container 1 - The filter is removed from its holder, placed in a petri dish, and sealed.

Container 2 - An unused filter is taken as a blank.

Container 3 - Loose particulate and acetone washings from all sample-exposed surfaces prior to the filter are placed in a glass jar, sealed, and labeled. Particulate is removed from the probe with the aid of a brush and acetone rinsing. The liquid level is marked after the container is sealed.

Container 4 - A minimum of 200 mL of acetone is taken for the blank analysis. The blank is obtained and treated in a similar manner as the contents of Container 3.

Contents of impingers 1-3 will be measured for volume and then discarded. Impinger 4 contents (silica gel) will be placed in a polyethylene bottle for subsequent weighing to the nearest gram.

Analytical Procedures

The analytical procedures during this program will be those described in USEPA Method 5.

Container No. 1 - The filter and any loose particulate matter from this sample container will be placed in a tared glass weighing dish, desiccated for 24 hours to a constant weight and weighed to the nearest 0.1 mg. Container No. 2 will be analyzed in the same manner.

Container No. 3 - The acetone washings will be transferred to a tared beaker and evaporated to dryness at ambient temperature and pressure. Then the contents will be desiccated for 24 hours and weighed to a constant weight to the nearest 0.1mg. Container No. 4 will be analyzed in the same manner.

The filter and acetone blanks will be analyzed in the same way as their respective sample fractions.

The term "constant weight" means a difference no more than 0.5 mg or 1 percent of total weight less tare weight, whichever is greater between two consecutive readings, with no less than 6 hours of desiccation between weighings.

2.2.6 Oxygen, Carbon Dioxide, Sulfur Dioxide, Nitrogen Oxides and Carbon Monoxide (USEPA Methods 3A, 6C, 7E and 10)

The stack gas O_2 and CO_2 sampling will be conducted following USEPA Method 3A procedures. O_2 and CO_2 concentrations will be measured using a Servomex, Inc. Model 1440C monitor.

Stack gas SO_2 sampling will be conducted following USEPA Method 6C using a Bovar Western Research Model 721-ATM photometric SO_2 monitor or similar.

Stack gas NO_x sampling will be conducted following USEPA Method 7E using a California Analytical Model 600 CLD chemiluminescent NO_x monitor or similar.

Stack gas CO sampling will be conducted following USEPA Method 10 using a Thermo Environmental Model 48H Gas Filter Correlation CO monitor.

As shown in Figure 2-2, sampling extraction to the O_2, CO_2, SO_2, NO_x and CO analyzers will be withdrawn through a stainless steel probe with a calibration tee connected to a heated Teflon sample line. The Teflon sample line is connected to ARI's Universal Analyzer Model No. 3082 electronic sample conditioner to remove moisture followed by a Teflon lined pump. A sample manifold is connected to the exhaust side of the pump with the intake for ARI's O_2, CO_2, SO_2, NO_x and CO analyzers. Calibration gases will be injected directly into the calibration tee to determine the measurement system bias relative to direct monitor injection or calibration error. The system bias determination will be conducted before and after each test run.

Calibration gases will be diluted from USEPA Protocol 1 high concentration standards. Dilutions will be performed using ARI's Environics Model 4040 Gas Dilution System. The dilution system will be verified onsite before the start of the testing following procedures described in 40 CFR, Part 51, Appendix M, USEPA Method 205.

Results from the sample runs will be continuously recorded by ARI's data acquisition system consisting of an Omega OMB-DAQ-56 datalogger connected to a computer for digital data archiving and data reduction.

SECTIONTWO Testing and Analytical Procedures

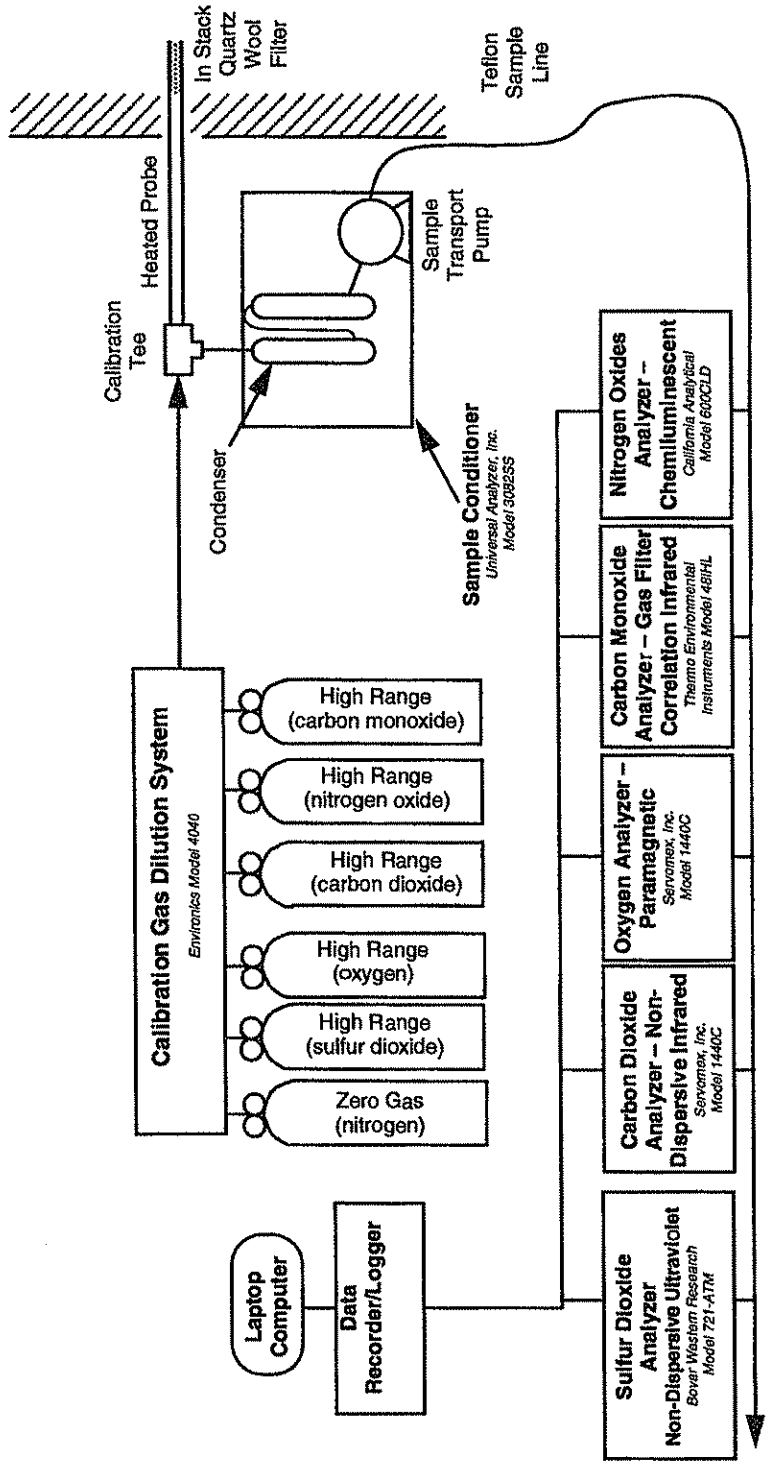


FIGURE 2-2. ARI REFERENCE METHOD CO_2, O_2, SO_2, NO_X AND CO SAMPLING SYSTEM

2.2.7 Total VOM Concentration (USEPA Method 25A)

Total VOM sampling will be conducted in accordance with USEPA Method 25A using a VIG Industries hydrocarbon analyzer equipped with a heated FID detector.

The sampling delivery system will consist of a stainless steel probe, filter and 3-way calibration tee (on the end of the probe) connected to a heated 250º F Teflon sampling line. The sampling lines connect directly into the analyzers located in ARI's mobile lab. The VOM analyzer is internally heated to keep the sample gas stream above its dew point (see Figure 2-3).

The VOM analyzer will be calibrated with applicable zero, low-range, mid-range and high-range gases as specified in USEPA Method 25A. The calibration gases will be generated from Protocol 1 calibration standards using an Environics Model 4040 mass flow gas dilution system. The dilution system will be verified on-site in strict accordance with USEPA Method 205.

The gases shall meet the calibration gas verification protocols of Alternate Number 1 or Alternate Number 2 as specified in USEPA Method 6C, Section 6.

A calibration error test and measurement system bias test will be performed prior to testing and a post calibration drift test shall be done after each test repetition on the monitor. The average zero calibration drift values obtained during each test run on the monitor will be used to correct the raw monitor data for each respective test run.

The monitor's data shall be collected at 15-second intervals by ARI's data acquisition system. The data acquisition system consists of an Omega OMB-DAQ-56 datalogger connected to a computer for digital data archiving and data reduction. DaqViewXL and Excel spreadsheet computer software will be used for calculation of emission rates.

2.2.8 Gas Dilution System Verification (USEPA Method 205)

All diluted calibration standards will be prepared using an Environics Model 4040 Dilution System that will be verified by a field evaluation at the job site prior to testing following the requirements of USEPA Method 205 (40 CFR 51, Appendix M).

After the calibration procedure is complete, two (2) diluted standards and a mid-range EPA Protocol 1 standard will alternately be introduced in triplicate and an average instrument response will be calculated for each standard.

No single response will differ by more than ±2% from the average response for each standard. The difference between the instrument average and the predicted concentration will be less than ±2% for each diluted standard. The difference between the certified gas concentration and the average instrument response for the mid-range EPA Protocol 1 standard will be less than ±2%.

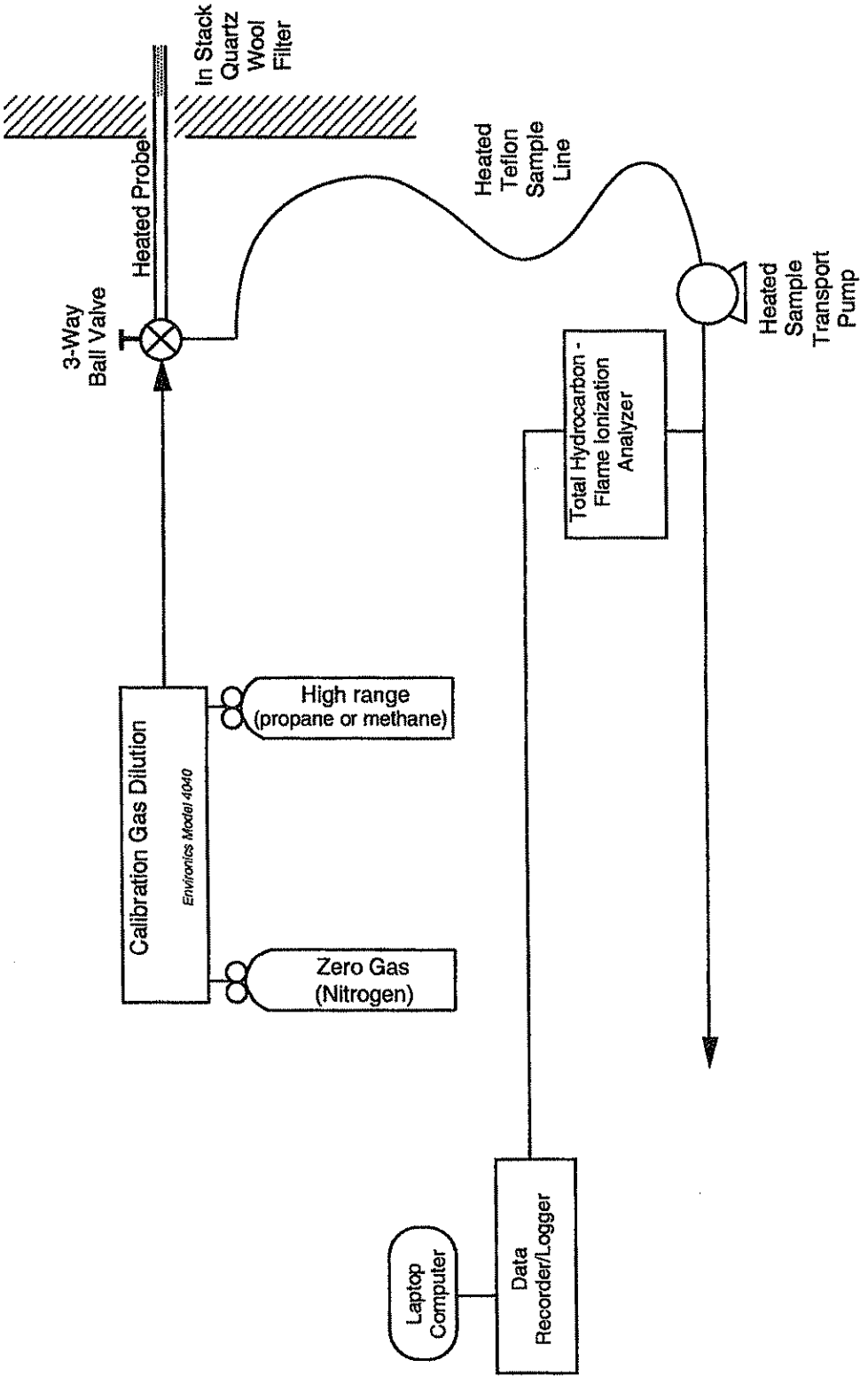


FIGURE 2-3. USEPA METHOD 25A VOM SAMPLING SYSTEM

SECTION THREE Data Reduction and Report Format

Field test data will be recorded on ARI's standard field test data sheets.

Reduction of field test data will be accomplished through the use of computer programs to calculate gas parameter data and emission rates. All calculations including the equations used will be documented in the final report with all computer printouts included in the Appendix. All field test data and test results are reviewed for completeness as well as accuracy prior to final reporting.

Following completion of field-testing, data reduction and analysis of collected samples, a comprehensive report of the test results will be prepared. The report format will be as follows:

1.0 INTRODUCTION AND SUMMARY OF TEST RESULTS

2.0 SAMPLING AND ANALYSIS PROCEDURES

3.0 TEST RESULTS AND DISCUSSION

APPENDIX

A Calculation Summaries

B ARI Field Data Sheets

C ARI Datalogger Data

D Operational Data

E Test Equipment Calibration Data

Typically a compliance test report turnaround for this type of project is 21 to 30 business days. ARI will attempt to issue the report 15 business days from the test date, contingent on the laboratory analysis and calibration submittals.

SECTION FOUR QA/QC Procedures

4.1 QA/QC PROCEDURES

Quality assurance will be ensured throughout the test program. QA/QC procedures specific to this compliance test program include the following:

4.1.1 EPA Methods 3A, 6C, 7E, 10 and 25A

1. Analyzers will be checked to meet manufacturers specifications at operating conditions.
2. Analyzers will be pre-checked for span and zero drift and linearity.
3. USEPA Protocol 1 and certified calibration gases will be checked and introduced into the analyzers.
4. The sample line integrity will be checked. All line heaters and grounding will be checked.
5. The sampling and analysis system will be set-up and maintained at equilibrium for 8 hours minimum on-site.
6. The flow meters, heaters, chillers and pumps will be pre-checked for proper operation.
7. Analyzer system performance will be checked using gas standards for bias and calibration error per applicable USEPA Method.

4.1.2 EPA Method 5

Pre-test calibration of sampling equipment will follow the protocol as detailed in the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III and the EPA test methods. All sample train components requiring calibration will be calibrated at the recommended interval using approved methods.

Calibration of the following equipment will be performed prior to testing. The equipment will be dedicated to this project after calibrations are made.

1) Pitot Tube
2) Differential Pressure Gauge
3) Stack Temperature Sensor
4) Dry Gas Meter Orifice
5) Dry Gas Meter
6) Dry Gas Meter Temperature Gauges
7) Flow Meter (rotometers)
8) Barometer
9) Digital Indicators
10) Dry Test Meter
11) Sampling Nozzles
12) Cylinder Calibration Gases

Type and configuration of sampling equipment will follow the 40 CFR 60 Appendix A protocols for USEPA Methods 1, 2, 3A, 4, 5, 6C, 7E, 10 and 25A and The USEPA Guidance Manual. Specifically, all sampling equipment will be prepared and maintained to meet or exceed USEPA method requirements.

1) Method 5 glassware will be pre-cleaned.
2) Sampling train heaters will be pre-checked.
3) Sampling nozzles will be pre-cleaned and inspected.
4) Glass fiber filters will be visually checked and weighed prior to field- testing.
5) Silica gel will be pre-weighed prior to field-testing.
6) The sampling equipment will be organized and packed using ARI Equipment Checklists.
7) CEM systems will be setup and fully calibrated prior to shipment to test site.
8) Calibration gas cylinders will be checked for content, volume, and expiration date.

4.1.3 EPA Method 205

The Environics Model 4040 mass flow gas dilution system will be verified on-site in strict accordance with USEPA Method 205 procedures. The verification will be performed using a Protocol 1 calibration gas.

4.1.4 Post-Test Calibration of Equipment

Post-test calibration of the same sampling equipment that was pre-tested will follow the same protocol using the post-test requirement where such a requirement exists. Otherwise post-test calibration will be conducted following pre-test procedures.

The dry gas meter in each console will be post-test calibrated at the average ΔH and highest vacuum documented during the test series using the post-test dry gas meter calibration form. Standard procedures and data forms will be used for post-test calibration of the equipment.

SECTION FIVE Test Schedule

Following is the proposed test schedule:

Day	Date	Scope of Work
1	12/8/08	Travel.
2	12/9/08	Set-up equipment.
3	12/10/08	Perform three (3) 96-minute test runs on the Casthouse Baghouse.
4	12/11/08	Perform three (3) 96-minute test runs on the Ironspout Baghouse; demobilize equipment and leave facility.

SECTION SIX Capabilities and Experience

ARI Environmental's offices in Wauconda, Illinois and Houston, Texas; specialize in conducting stack emission, fugitive leak detection, ambient air and in-plant OSHA type testing for industrial clients.

During the past 25 years, ARI personnel have conducted over 5,000 separate stack emission tests for a variety of industrial clients throughout North America for the determination of degree of source compliance and to yield emissions data and control equipment performance data for in-house engineering purposes.

ARI presently has over 80 trained personnel for conducting source emission sampling, fugitive leak detection monitoring, ambient air monitoring and OSHA sampling programs.

ARI has USEPA Method 5 particulate sampling trains, Method 17 particulate trains, TVA-1000 monitors and a variety of dataloggers for VOC leak detection programs, field use gas chromatographs and continuous FID units for hydrocarbon sampling, USEPA Method 18 and 25 sample trains, SO_2, NO_x and CO sampling and analysis equipment, Orsats for on-site gas composition analysis, and a modern, well equipped analytical laboratory for collected sample analyses including gas and liquid chromatography, GC/MS and FTIR capabilities.

ARI's six mobile test trailers include full service Continuous Emissions Monitoring Systems for on-site analysis of CO_2, O_2, CO, NO_x, SO_2 and total hydrocarbons (THC). The data can be immediately accessed and reduced by ARI's data logger that is linked to a computer. This gives the client on-site knowledge of the testing program's results. The mobile test trailers also house an SRI Model 8610 Gas Chromatograph equipped with a Flame Ionization Detector (FID), a Thermal Conductivity Detector (TCD) and Flame Photometric Detector (FPD), GC/MS and FTIR for the on-site analysis of organics, inorganics and sulfur compounds.